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(81) 指定国
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DE (欧州特許), FR (欧州特許), GB (欧州特許),
IT (欧州特許), LU (欧州特許), NL (欧州特許),
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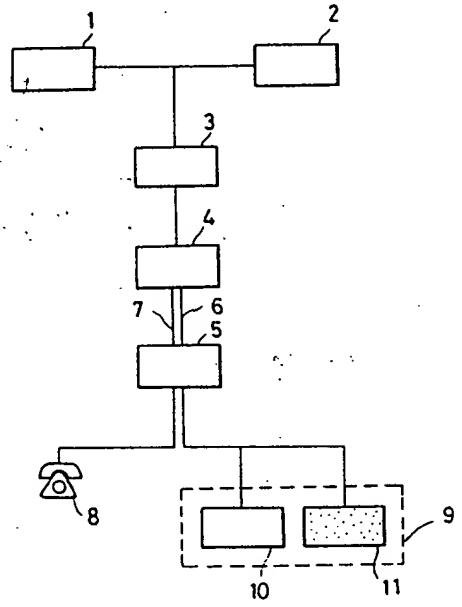
corresponds to JA 0028287 H04N 7/14 2/1986

(54) Title: DATA TRANSMITTING DEVICE UTILIZING A TELEPHONE

(54) 発明の名称 電話を利用した情報伝達装置

(57) Abstract

The data transmitting device comprises an imaging device (1) which images picture data that is to be transmitted in real time, a digital circuit (3) which separates the image obtained by the imaging device (1) into picture elements, and which converts these elements into digital signals of a number that can be transmitted over a small number of telephone circuits, an interface (4) relative to the telephone circuits, transmitters (6, 7) for sending the picture data to the other person over the telephone circuits, a receiver (5) for receiving the picture signals, and a device (9) that will be driven by the picture signals that are received. The device enables the picture data to be reliably comprehended by the other person.



useful for the hearing impaired, note translation

(57)要約

本発明になる情報伝達装置は伝達すべき実時間画像情報を撮影する撮影装置１と、この撮影装置１で得られた映像を画素に分解し少ない本数の電話回線で送れる程度のデジタル信号に変換するデジタル回路３と、電話回線とのインターフェイス４と、電話回線を介して画像情報を相手方に送る送信装置６，７とこの画像信号を受信する受信装置５と、受信した画像信号に応じて駆動される被駆動装置９とを設け、相手方に対し確実に画像情報を理解させることができるようにしたものである。

明　　細　　書

電話を利用した情報伝達装置

技術分野

本発明は電話を利用した簡易画像情報伝達装置に関するものである。

背景技術

例えば、高度の難聴者との対話の場合には音声と同時に視覚情報を与えると対話内容の認識を助ける効果があることが知られており、その手段の１つとして読唇術の訓練が行なわれている。

一方、高度な難聴者にとっては映像が伴なわない従来の電話では対話が困難な場合が多い。

そこで、映像を伴なったものとしてテレビ電話が考えられるが、テレビ電話は１００回線程の電話回線を必要とするため膨大な費用が必要であり一般的ではない。

そこで、本発明者は極めて簡易型の画像情報を伴なった情報伝達手段の１つとして昭和57年 4月16日付けで口唇等の撮影装置を明らかにした（特開昭58-180149）。

この装置は頭部を利用して装着され、話者の顔面又は口唇部分を撮影するもので、話者がどの方向を向いても撮影範囲は変化しないようになっている。

この撮影装置を用いて口唇情報を与える手段としてはテレビが考えられる。

例えば難聴者の教室においては話者である先生が黒板に向かい、聞き手である生徒に背を向けている時の会話は先生の

口唇が見えないため、生徒には会話の内容がわからない。

このような場合、前述した撮影装置により話者の口唇を撮影し、テレビ画面に表示すれば講義の内容がわかる。

しかし、テレビ画面上の口唇情報を見ているとノートを見ることができないため講義内容のノートをとることができない。

即ち、映像を伴なった対話だけでは難聴者の問題は解決できず、他の手段が必要である。

本発明は以上のような事情に鑑み成されたもので、難聴者に対し確実に対話内容を理解させることができるように構成した電話を利用した情報伝達装置を提供することを目的としている。

発明の開示

本発明はこの目的を達成するため伝達すべき実時間画像情報を撮影する撮影装置と、この撮影装置で得られた映像を画素に分解し、少ない本数の電話回線で送れる程度のデジタル信号に変換するデジタル回路、電話回線とのインターフェイスを備え、電話回線を介して画像情報を相手方に送る送信装置と、この画像信号を受信する受信装置と、受信した画像信号に応じて駆動される被駆動装置とを設ける構成を採用した。

図面の簡単な説明

第1図以下は本発明の一実施例を説明するもので第1図は全体構造を説明するブロック図、第2図は撮影装置の説明図、第3図は送信する画像の説明図、第4図はテレビ電話と

して利用する場合の説明図、第５図は手話に適用した場合の説明図、第６図は教室に適用した場合の説明図、第７図はテレビに応用した状態の説明図である。

発明を実施するための最良の形態

第１図以下は本発明の一実施例を説明するもので、第１図には装置の全体構造をブロック図として示してある。

即ち、第１図に於て符号１で示すものは撮影装置でこの撮影装置１によって撮影された画像は直接モニタ２に表示されると共にデジタルプロセッサ３により後述するようにして画素に分解され、インターフェイスの例として示すモデム４を介して相手方の受信装置５に送られる。

インターフェイスとしてはモデムの他に音響カプラなどを用いても良い。

モデム４と相手方の受信装置５との間は画像伝送用の１本の電話回線６と、音声専用のもう１本の電話回線７によって接続されている。

受信装置５は電話機８及び被駆動装置９に接続されている。

被駆動装置９としては表示装置１０又は触知ボコーダ１１が選ばれている。

撮影装置１は第２図に示す様に頭部に装着される円弧状のサポータ１２とアーム１３とを備えており、アーム１３の基端はサポータ１２側に摺動自在に、かつ回転自在に連結されている。

アーム１３の先端は顔面側に向かって湾曲しており、その

先端には撮影用の光学系（図示省略）が収容されており、読み取られた画像は画像処理部１４に導かれる。

画像処理部１４は配線１５を介してモニタ２に導かれている。

又、読み取られた画像は第１図に示した様な電話を利用した情報伝達装置１６を介して相手方の被駆動装置９側へ送られる。

ところで、前述した様に画像の伝送をテレビ電話方式で行なうと、１００本以上の電話回線が必要なため、主として経済的な理由から実現化が困難である。

本発明に於ては現在の電話回線の１回線分で伝送できる様に第３図に示すように口唇周辺のみを24×24ドットの画素の分解して伝送する方式を採用している。

そこで、なるべく多くの情報を伝送をするために最大の伝送能力を持つ9600ＢＰＳのモデムを用いることにした。

9600ＢＰＳのモデムで伝送できる最大情報量は１バイト内でスタートとストップに１ビットずつ取られるため、9600×(10-2)÷10＝7680ＢＰＳである。

従って毎秒３０枚の画像を伝送しようとすると画素数は16×16ドットであり、24×24ドットの場合には毎秒１３．３枚となり、確実に視認できる動画を送ることができる。

この画情報はデジタルプロセッサをコントロールする計算機の２３２Ｃの出力回路を通して送られ、受信側で２３２Ｃからの信号をマイクロコンピュータに入力させ、横２倍に拡大してビデオラムに書き込み、表示装置１０ド

示する。

難聴者は第４図に示すように伝送されてきた動画像を見ながら電話を介しての音を補聴器で聞きつつ両者を併用して会話を行なうことができる。

一方、被駆動装置としては表示装置ばかりではなく、触知ボコーダ１１も使用することができる。

この触知ボコーダ１１は多数、例えば20×20＝400 の小振動体を有し、これらの振動体を発音に応じた組合わせにより振動させ、利用者の手のひらなどを刺激することにより音声情報を伝達するものである。

触知ボコーダの動作制御は受信装置５側に設けられているマイクロコンピュータによって行なわれる。

本装置の利用者は被駆動装置として表示装置１０，触知ボコーダ１１のいずれを用いても良く、場合によっては両者を併用してもよい。

次に本発明装置の応用例をいくつか示す。

第５図は撮影対象物が顔面ではなく、手話に適用した場合で、指先部分を前述したのと同様にして撮影し、伝送し、手話による会話を可能にしたものである。

第６図は教室において適用した場合を示している。

先生は撮影装置を頭部に装着しており、生徒は机上にモニタ２や触知ボコーダ１１などを載置し、先生が黒板に向かっていても会話情報を得ることができる。

又、第７図はテレビ放送に適用した例を示す。

即ち男女の声優１７，１８がスクリーン１９に投影された

ドラマを見ながら吹き換えを行ない口唇情報を撮影し、これをテレビ２０の画面の一部に男女の口唇情報２１，２２として表示すれば、ドラマの登場人物がどの方向を向いていても、会話内容を知ることができる。

なお画像情報伝送用の電話回線は画像情報量が多い場合、２～３本用いても良い。

以上の説明から明らかなように、本発明によれば、電話回線を１本用いるだけで必要な画情報の伝送を行なうことができ、受信側ではこれを再生し、動く画像として、あるいは触知ボコーダを介しての刺激として利用者側に伝えることができ、難聴者に対して電話を介しての会話を自由に行なわせることができる。

産業上の利用可能性

以上説明したように本発明に係る情報伝達装置は、難聴者に対して確実に対話内容を理解させることができるように構成されており、難聴者に対する情報伝達装置として最適である。

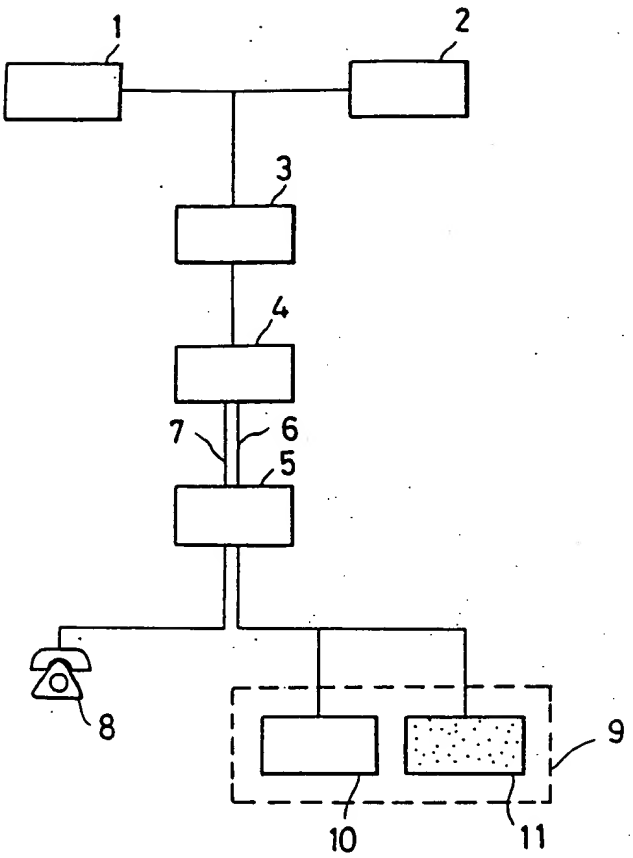
請求の範囲

1)伝達すべき実時間画像情報を撮影する撮影装置とこの撮影装置で得られた映像を画素に分解し、少ない本数の電話回線で送れる程度のデジタル信号に変換するデジタル回路，電話回線とのインターフェイスを備え、電話回線を介して画像情報を相手方に送る送信装置と、この画像信号を受信する受信装置と、受信した画像信号に応じて駆動される被駆動装置とを備えていることを特徴とする電話を利用した情報伝達装置。

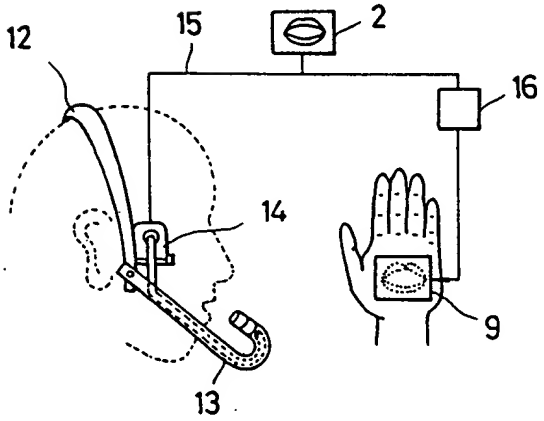
2)撮影される対象物は話者の顔面又は口唇であり、被駆動装置は画像表示装置であることを特徴とする請求の範囲第1項に記載の電話を利用した情報伝達装置。

3)被駆動装置は触知ボコーダであり、この触知ボコーダにより画像信号を利用者の皮膚面の刺激部位に触覚刺激として与えるように構成したことを特徴とする請求の範囲第1項に記載の電話を利用した情報伝達装置。

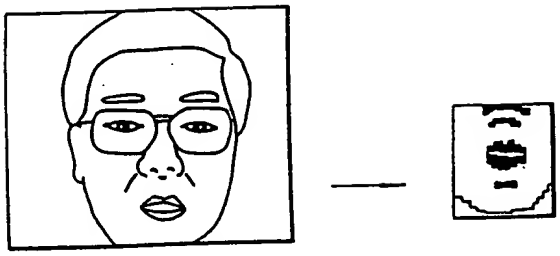
第 1 図



第 2 図

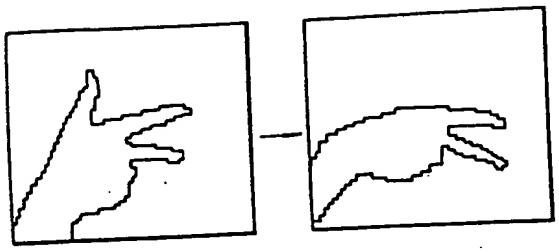


第3図

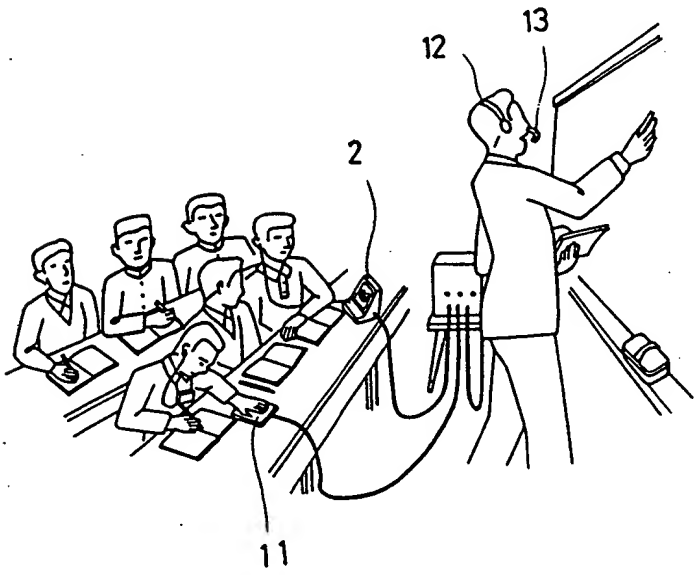


第4図

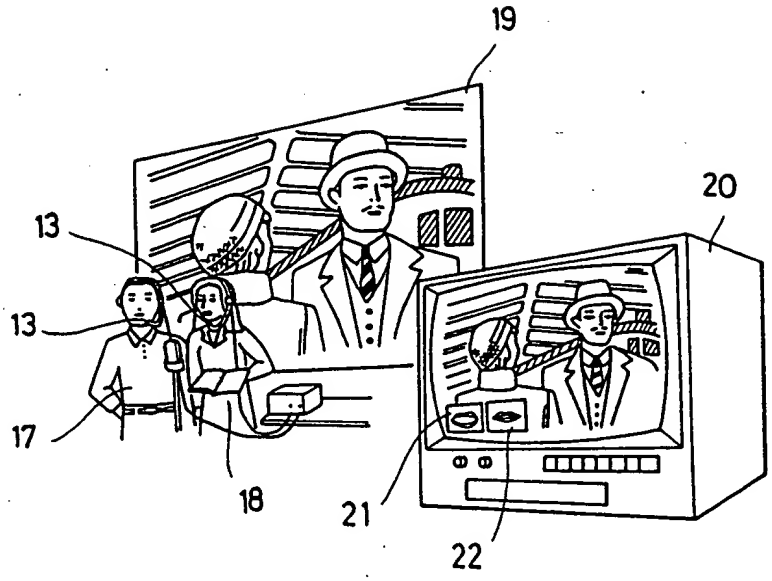
第5図



第6図



第 7 図



INTERNATIONAL SEARCH REPORT

International Application No. PCT/JP85/00398

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) [3]

According to International Patent Classification (IPC) or to both National Classification and IPC

Int. Cl[4] H04N7/14

II. FIELDS SEARCHED

Minimum Documentation Searched [4]

Classification System	Classification Symbols
IPC	H04N7/14, 7/12 A61F11/04

Documentation Searched other than Minimum Documentation to the Extent that such Documents are included in the Fields Searched [5]

Jitsuyo Shinan Koho	1949-1985
Kokai Jitsuyo Shinan Koho	1972-1985

III. DOCUMENTS CONSIDERED TO BE RELEVANT [14]

Category*	Citation of Document, [16] with indication, where appropriate, of the relevant passages [17]	Relevant to Claim No. [18]
Y	JP, A, 54-54516 (Nippon Telegraph & Telephone Public Corp.) 28 April 1979 (28. 04. 79) (Family: none)	1-3
Y	JP, A, 56-86592 (Oki Electric Industry Co., Ltd.) 14 July 1981 (14. 07. 81), Fig. 2 no Modem no Shiyo (Family: none)	1-3
Y	JP, A, 58-180150 (Ono Hiroshi) 21 October 1983 (21. 10. 83), Specification, page 3, last line or less, no Shokuchi Vocoder (Family: none)	3

* Special categories of cited documents: [15]

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search [1]	Date of Mailing of this International Search Report [2]
October 14, 1985 (14. 10. 85)	October 21, 1985 (21. 10. 85)
International Searching Authority [3]	**Signature of Authorized Officer [20]**
Japanese Patent Office	

Form PCT/ISA/210 (second sheet) (October 1981)

国際調査報告

国際出願番号PCT/JP 85/00398

I. 発明の属する分野の分類

国際特許分類(IPC) Int.Cℓ⁴
H04N 7/14

II. 国際調査を行った分野

調査を行った最小限資料

分類体系	分類記号
IPC	H04N 7/14, 7/12 A61F 11/04

最小限資料以外の資料で調査を行ったもの

日本国実用新案公報 1949−1985年
日本国公開実用新案公報 1972−1985年

III. 関連する技術に関する文献

引用文献のカテゴリー※	引用文献名 及び一部の箇所が関連するときは、その関連する箇所の表示	請求の範囲の番号
Y	JP, A, 54−54516 (日本電信電話公社) 28. 4月. 1979 (28. 04. 79) (ファミリーなし)	1−3
Y	JP, A, 56−86592 (沖電気工業株式会社) 14. 7月. 1981 (14. 07. 81), 第2図のモデムの使用 (ファミリーなし)	1−3
Y	JP, A, 58−180150 (小野 博) 21. 10月. 1983 (21. 10. 83), 明細書3頁最下行以下の触知ボコーダ (ファミリーなし)	3

※引用文献のカテゴリー
「A」特に関連のある文献ではなく、一般的技術水準を示すもの
「E」先行文献ではあるが、国際出願日以後に公表されたもの
「L」優先権主張に疑義を提起する文献又は他の文献の発行日若しくは他の特別な理由を確立するために引用する文献(理由を付す)
「O」口頭による開示、使用、展示等に言及する文献
「P」国際出願日前で、かつ優先権の主張の基礎となる出願の日の後に公表された文献
「T」国際出願日又は優先日の後に公表された文献であって出願と矛盾するものではなく、発明の原理又は理論の理解のために引用するもの
「X」特に関連のある文献であって、当該文献のみで発明の新規性又は進歩性がないと考えられるもの
「Y」特に関連のある文献であって、当該文献と他の1以上の文献との、当業者にとって自明である組合せによって進歩性がないと考えられるもの
「&」同一パテントファミリーの文献

IV. 認証

国際調査を完了した日	国際調査報告の発送日
14. 10. 85	21.10.85
国際調査機関	権限のある職員 5C 7013
日本国特許庁 (ISA/JP)	特許庁審査官 木南 仁 ㊞

様式PCT/ISA/210(第2ページ) (1981年10月)

PTO 3359

Japan, Kokai
Publication No.: WO 86/01060

DATA TRANSMITTING DEVICE UTILIZING A TELEPHONE

Hiroshi Ono

UNITED STATES PATENT AND TRADEMARK OFFICE
Washington, D. C.
August 1989

Country	: Japan
Document No.	: 54-54516, 56-86592, 58-86592
Document type	: Patent Application
Language	: Japanese
Inventor	: Hiroshi Ono
Applicant	: Mitsubishi Electric Corporation
IPC	: --
Application date	: June 3, 1987
Publication date	: 1985
Foreign language title	: DENWA OH RIYOU SHITA JOUHOU DENTATSU SOUCHI
English title	: DATA TRANSMITTING DEVICE UTILIZING A TELEPHONE

SPECIFICATION /1*

1. Title of New Utility Model: Data Transmitting Device Utilizing a Telephone

2. Scope of Claim for Registration of the Utility Model Patent: This invention relates to a data transmission system utilizing a telephone.

3. Previous Technology.

For example, it is known that in the case of conversations with the severely hearing impaired, when audio and visual data is given, the effect is a better understanding of the substance of the conversation.

Currently, lip reading is being practiced as one of the ways of accomplishing this.

On the other hand, in the past, with telephones without visual images, there were many instances of confusion in conversations with the severely hearing impaired.

Due to this, the idea of an image-televised telephone was possible, but the televised telephones required at least 100 telephone lines which made the costs enormous, and therefore, the idea impractical.

Therefore, this inventor has gone to the extreme of having found one way of data transmission with image transmission by way

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* Numbers in the margin indicate pagination in the foreign text.

of simple design on April 16, 1983 with a filming system for the mouth region. (Patent No. 58-180149).

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Having learned what to do from the above mentioned instance, this inventor has made his goal to offer a design of a data transmission system utilizing a telephone that makes certain that

the severely hearing impaired can understand the contents of a conversation.

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This inventor, in order to complete this goal, has accepted the design that is made up of: a film system that films in real time communication of image data, a digital circuit that converts an image from the film system which has been broken down to basic images (these few images were then sent via telephone lines in the form of digital signals), the transmitting system having an interface with the telephone line and which, via the telephone line, sends image data to the other party, the receiving system which receives this image signal, and the non-moving system that moves in response to the received image signal.

5. Sample explanation of the illustrations

Beneath the 1st illustration the practical application is explained, therefore Illustration #1 is a block illustration of the entire structure. Illustration #2 is an explanation of the filming system. Illustration #3 is an explanation of the /3 transmitted image. Illustration #4 is an explanatory diagram of a situation where the televised telephone is utilized. Illustration #5 is an illustration explaining the situation where sign language is applied. Illustration #6 explains applications in the classroom. Illustration #7 is an explanation diagram of the condition after which the television has been adapted.

6. The most practical form for the invention.

Below Illustration #1 is the explanation of the practical application of this invention, and the entire structure is shown as a block illustration. Namely, the filming system shows the #1 code as in Illustration #1; the image, filmed by filming system (1), is shown directly on a monitor (2). Also, the image is broken down by the digital processor (3) and then the interface modem (4) is sent to the other party's receiving system (5).

Aside from using a modem as an interface, a sound coupler is also acceptable.

The connection between the modem (4) and the receiving system (5) is one telephone line (6) for image transmitting and one more telephone line (7) exclusively for voice.

The receiving system is connected to the phone unit (8) and the non-moving system (9). As for the non-moving system (9), the display system (10) and the sensory system (11) have been selected.

The filming system (1), in the mode shown in Illustration #2, is shown as having, attached to the head, the circle arch-shaped support (12), and the arm (13) is facing the facial area /4 and is curved, and at the tip is an optical device (not pictured). The read image is guided to the image processing center (14). The image processing center (14) via wiring (15) is guided to the monitor (2).

Also, the read image is sent to the other party's non-moving system (9) via the data transmission system utilizing the telephone as shown in Illustration #1. If, however, the image's electrical transmissions were to be sent by the televised telephone method, because over one hundred telephone lines would be necessary, the first consideration from the economic view would be that realistically it is too difficult.

This invention, in order to send electrical transmission through one telephone line, as shown in Illustration #3, has adopted the method of breaking down the mouth region image to 24X24 dots and sending the electrical transmission.

Therefore, in order to send a large amount of data by electrical transmission, it was decided that the modem with the greatest capacity for electrical transmission, the 9600BPS, would be used. The capacity for electrical transmission by the 9600BPS, since it takes one bit at stop or start within a byte, is 9600 X (10-2)/10 = 7680BPS. Therefore, 30 images sent electrically per second would require it to be in 16X16 dot, 24X24 dot would require 13.3 pictures per second; and a moving image that is definitely recognizable can be sent.

This image data is sent through the 232C output circuit of the computer that controls the digital processor and on the receiving side the 232C signal is input into the micro-computer and is inscribed in the video ROM 2 times its length and width and displayed on the display system (10). /5

The hearing impaired, as shown in Illustration #4, can watch the moving image sent by electrical transmission and along with that, hear the voice on the telephone via a hearing aid and then carry on the conversation.

On one hand, the non-moving system does not have to be only the display system, but can also include the sensory vocoder (11).

There are many sensory vocoders (11), for example having an oscillating body of 20X20 = 400, an oscillating body responding to the voice oscillates together with it, the user's palm is stimulated, and the voice data is automatically transmitted. The motion controller for the sensory vocoder is controlled by the micro-computer in the receiving system (5).

The user of this system may use as the non-moving system the display system (10), or the sensory vocoder (11). Depending on the situation, both systems may be used.

7. Next, the various examples of this system will be shown.

In Illustration #5 the main focus is not on filming the face, but in using sign language. The filmed areas, as mentioned above, use the fingers and hand and with electrical transmission, a conversation consisting of sign language is possible.
Illustration #6 shows the case of classroom use. The instructor has installed the filming system to the facial area and the students have a monitor (2) and/or the sensory system on the desk. So while the instructor faces the blackboard, the students can still understand the lecture.

Furthermore, Illustration #7 shows the uses for television broadcasts. For example, voice actors (17) and (18), /6 while viewing the drama projected on screen (19), dub the voices and their mouth areas are filmed, and if these voice actors' mouth regions (21,22) are shown on one part of the television screen, the contents of the conversation are understood regardless of where the actors face is. Also, if there is a lot of image data transmission it is acceptable to use 2 to 3 more telephone lines.

As clearly stated above, from this invention, image transmission by electrical transmission can be done with only one telephone line. The receiving side processes this as a moving image and also the sensory system can communicate this through stimulation to the user's side and the hearing impaired are able to converse freely via telephone.

8. Possible industrial uses.

As explained above, this invention of a data transmission system can ensure that contents of a conversation will be understood by the hearing impaired and this is the best method of data transmission for the hearing impaired.

9. Area of Application

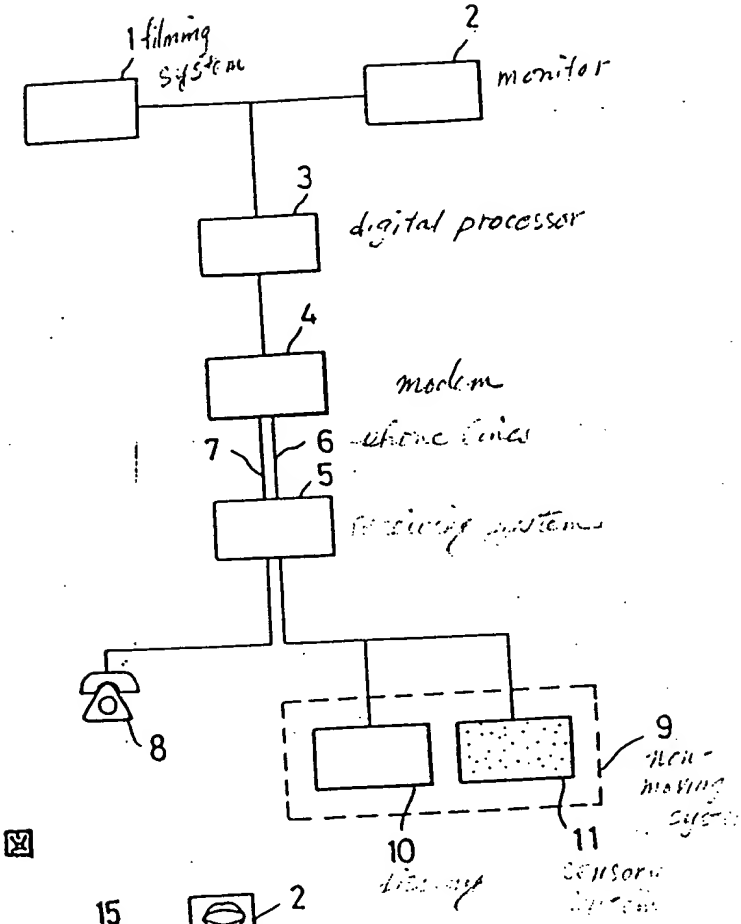
1.) The main characteristic of the data transmission system utilizing a telephone is the possibility of the image having been broken down after being filmed by the filming system for real time data transmission, and to be sent as digital signals through a few telephone lines to be converted by the digital processor, and having included an interface with the telephone line that allows

the image data to be sent to the other party's receiving system by the transmitting system, and finally the received image signal being received by the non-moving system.

2.) The main characteristic to be considered as written in part 1 is that the area to be filmed is the mouth region of the face, and the non-moving system is the image display system of the data transmission system utilizing a telephone.

3.) The main characteristic to be considered as written in part 1 is that the data transmission system utilizing a telephone has been designed to give a sensory stimulation in the palm area of the user of the image signal via the sensory vocoder.

第 1 図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digital processor
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modem
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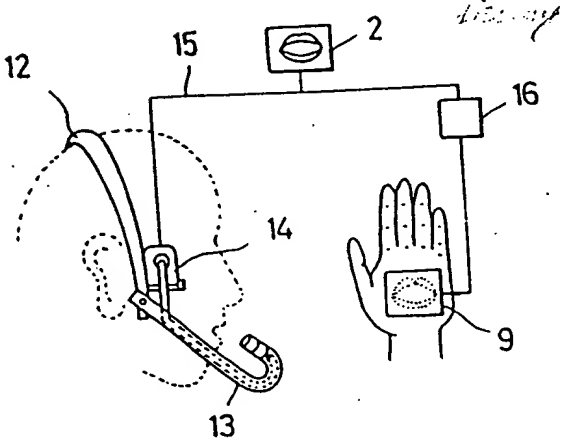
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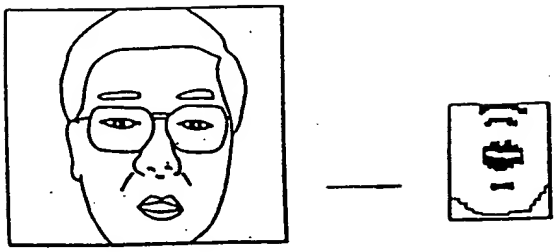
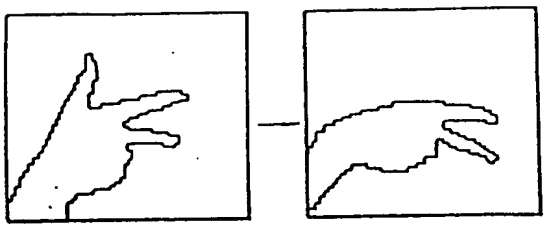


第4図

第5図



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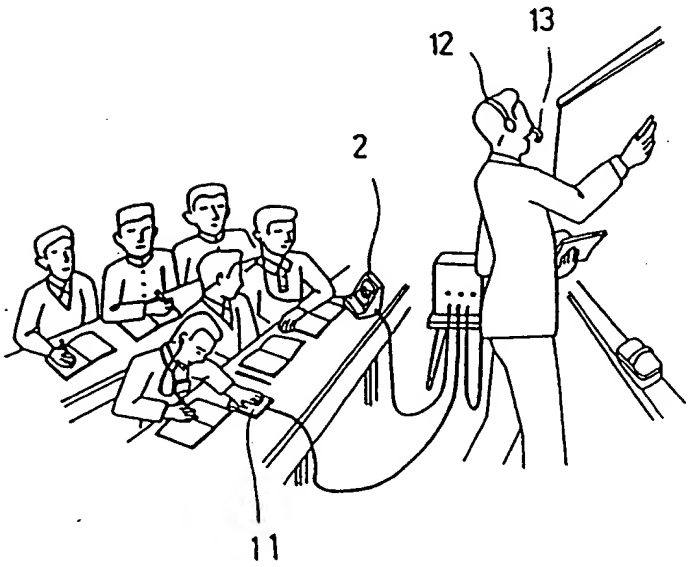

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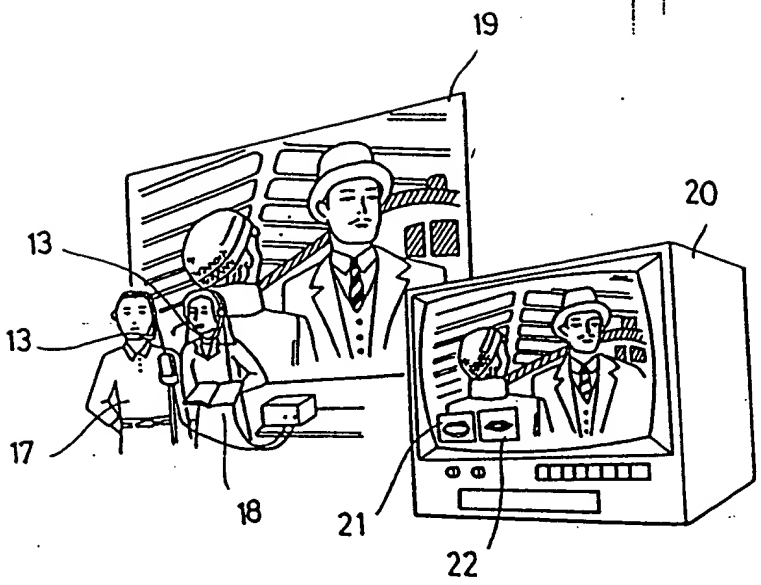

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Document type	:	Patent Application
Language	:	Japanese
Inventor	:	Hiroshi Ono
Applicant	:	Mitsubishi Electric Corporation
IPC	:	--
Application date	:	June 3, 1987
Publication date	:	1985
Foreign language title	:	DENWA OH RIYOU SHITA JOUHOU DENTATSU SOUCHI
English title	:	DATA TRANSMITTING DEVICE UTILIZING A TELEPHONE

/1*

SPECIFICATION

1. Title of New Utility Model: Data Transmitting Device Utilizing a Telephone

2. Scope of Claim for Registration of the Utility Model Patent: This invention relates to a data transmission system utilizing a telephone.

3. Previous Technology.

For example, it is known that in the case of conversations with the severely hearing impaired, when audio and visual data is given, the effect is a better understanding of the substance of the conversation.

Currently, lip reading is being practiced as one of the ways of accomplishing this.

On the other hand, in the past, with telephones without visual images, there were many instances of confusion in conversations with the severely hearing impaired.

Due to this, the idea of an image-televised telephone was possible, but the televised telephones required at least 100 telephone lines which made the costs enormous, and therefore, the idea impractical.

Therefore, this inventor has gone to the extreme of having found one way of data transmission with image transmission by way

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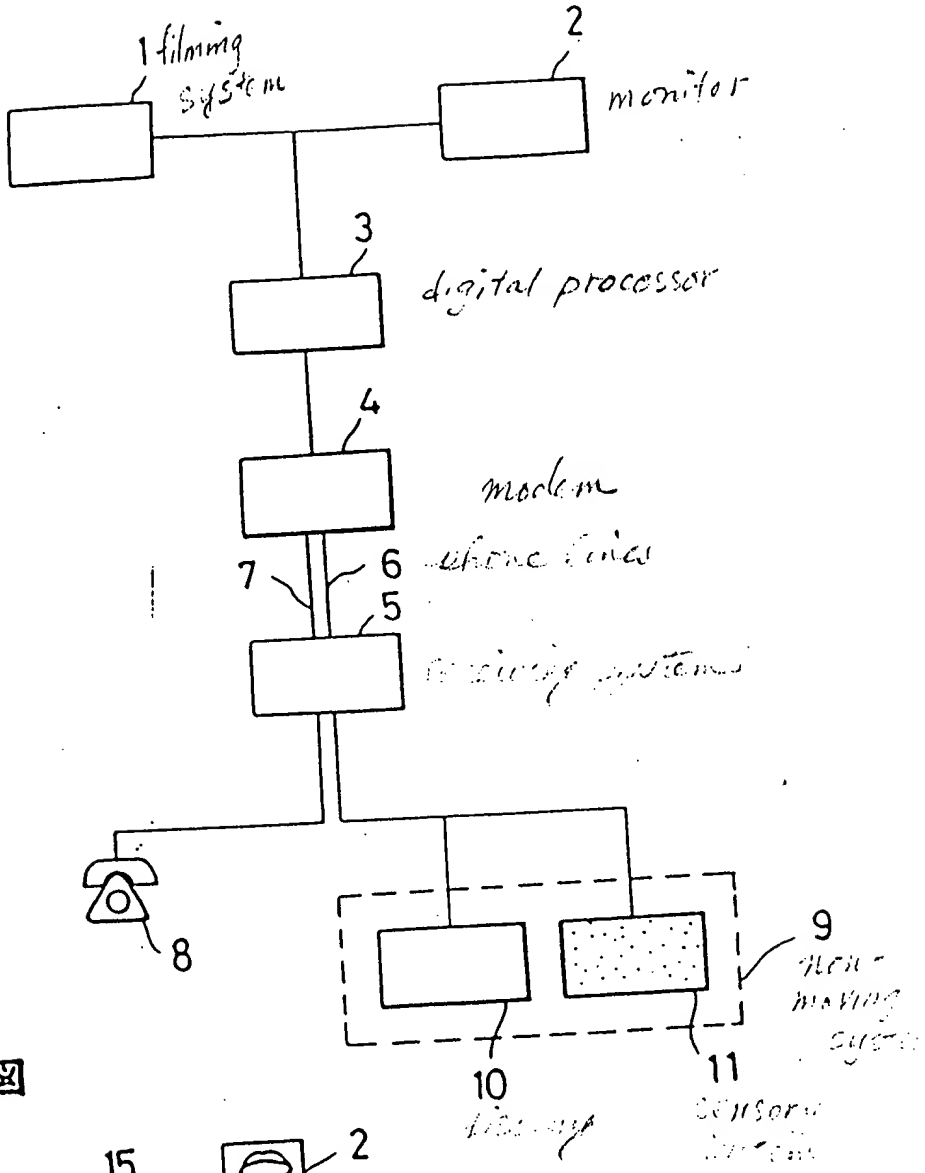
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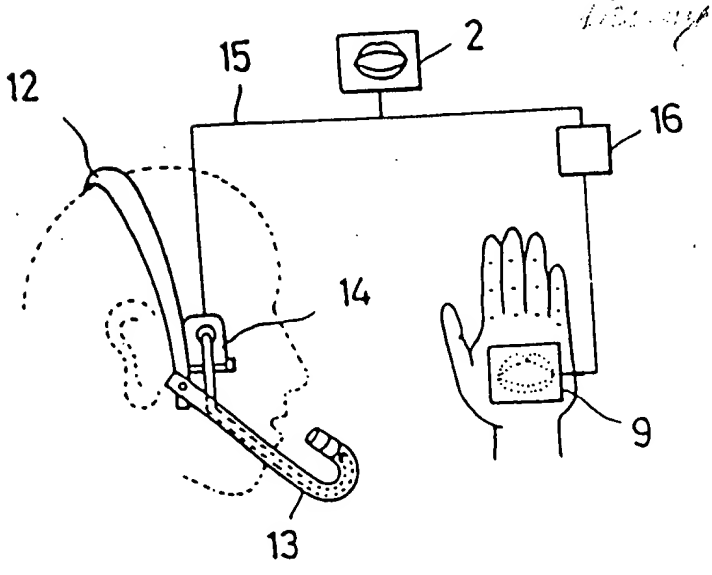
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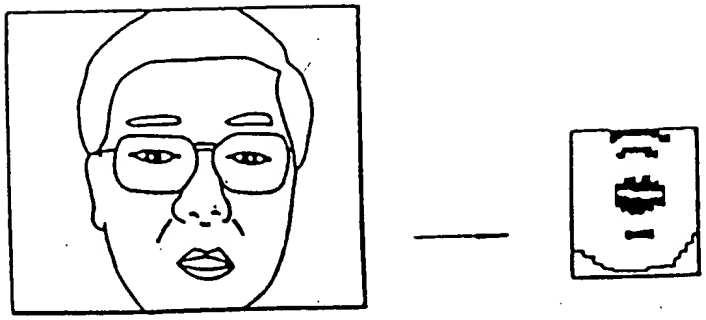

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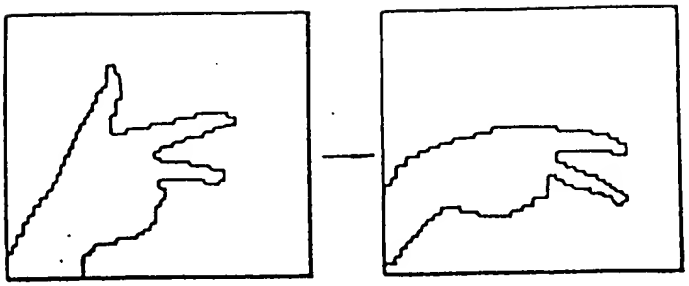

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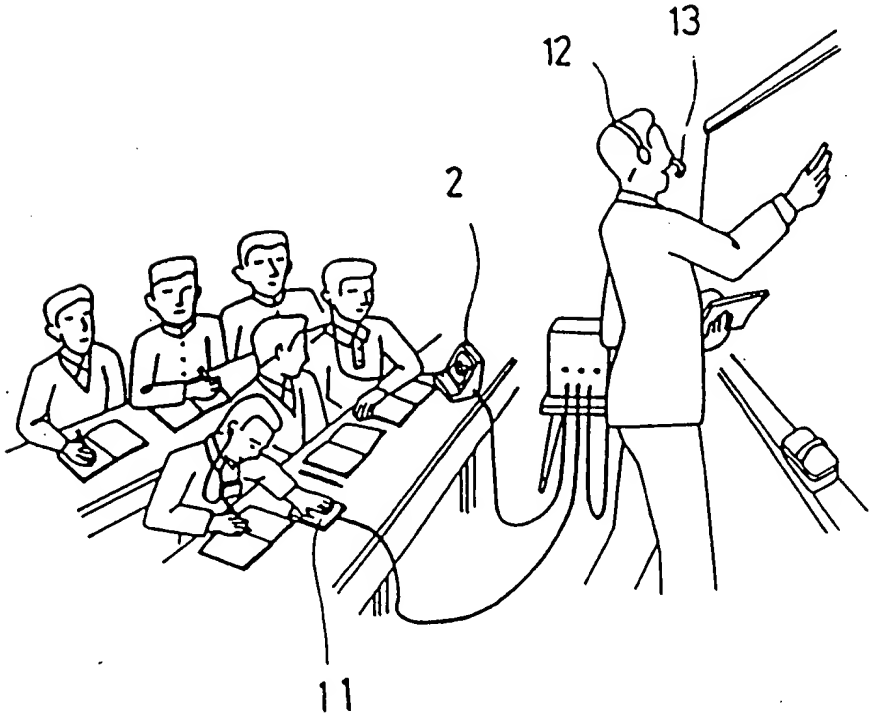

第 7 図